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## 11.0 WATER QUALITY MONITORING PROGRAM

### 11.1 Program Summary

#### 11.1.1 Program Overview

The main theme underlying the Regional Board's objectives (listed below) is maintaining the integrity of receiving waters and their ability to sustain beneficial uses identified in the Basin Plan. This parallels the Permittees' long-standing concern with the management of environmental resources. For example, many of the monitoring stations have been sampled since the mid-1970s, and there are many past instances of cooperation with other agencies regarding specific environmental problems and/or areas of concern.

Thus, while the Permittees view compliance with the terms of the Permits as of paramount importance, there is also an underlying role of governmental stewardship for key environmental resources that are highly valued by residents of Orange County.

This monitoring plan strives to link permit compliance with this larger set of management issues.

#### 11.1.2 Program Commitments

The monitoring program was developed to help Permittees ensure compliance with the Santa Ana and San Diego Permits and reduce any impact urban storm water may have on overall water quality and beneficial uses.

The major program commitments and the subsections in which they are described in detail include:

- Review and implementation of the dry- and wet-weather programs for both the Santa Ana and San Diego regions within Orange County (**Section 11.2**).
- Continued review and identification of water quality planning initiatives to better address site-specific urban water quality issues (**Section 11.3**).

In addition to the major program monitoring commitments listed above, the following performance commitments provide consistency among the programs, define requirements for permit compliance, and measure performance:

- The Permittees will revise the water quality monitoring program and associated timelines annually. These changes may be due to necessary timeline adjustments, newly identified water quality problems or information gained through experience or the research/monitoring programs. The revisions will be discussed in the Annual Status Reports.
- The Permittees will participate in future Southern California Bight Regional Monitoring Programs. This will be reported in the Annual Status Report.

- The Permittees will participate in the Southern California Stormwater Monitoring/Research Cooperative Program. The key focus of the program is to develop the methodologies and assessment tools to more effectively understand urban municipal stormwater and non-stormwater impacts to receiving waters. This will be reported in the Annual Status Reports.
- The Permittees will re-evaluate and revise the elements of the water quality monitoring program in 2003. The revised program will be submitted with the 2003 Annual Status Report. Design of the dry weather portions of the monitoring program in the San Diego region of the County were completed in February 2003. Design of both the wet and dry weather portions of the Santa Ana region permits will be completed mid-2003.

### 11.1.3 Regulatory Requirements

The requirements and objective of the Monitoring Program have been laid out in the Santa Ana and San Diego Regional Board Permits for each respective area.

*Objectives of San Diego Region Monitoring Programs* - As laid out in the San Diego Regional Board Permit the following are the major objectives of the monitoring program:

- Assess compliance with the NPDES permit;
- Measure the effectiveness of Urban Runoff Management Plans;
- Assess the chemical, physical, and biological impacts to receiving waters resulting from urban runoff; and
- Assess the overall health and evaluating long-term trends in receiving water quality.

*Objectives of Santa Ana Region Monitoring Programs* - As laid out in the Santa Ana Regional Board Permit the following are the major objectives of the monitoring program:

- Develop and support an effective municipal urban runoff and non-point source control program
- Define water quality status, trends, and pollutants of concern associated with urban storm water and non-storm water discharges and their impact on the beneficial uses of the receiving waters
- Characterize pollutants associated with urban storm water and non-storm water discharges and to assess the influence of urban land uses on water quality and the beneficial uses of receiving waters
- Identify significant water quality problems related to urban storm water and non-storm water discharges
- Identify other sources of pollutants in storm water and non-storm water runoff to the maximum extent possible (e.g., atmospheric deposition, contaminated sediments, other non-point sources, etc.)

- Identify and prohibit illicit discharges
- Identify those waters, which without additional action to control pollution from urban storm water discharges, cannot reasonably be expected to attain or maintain applicable water quality standards required to sustain the beneficial uses in the Basin Plan (TMDL monitoring)
- Evaluate the effectiveness of existing municipal storm water quality management programs, including an estimate of pollutant reductions achieved by the structural and nonstructural BMPs implemented by the Permittees
- Evaluate costs and benefits of proposed municipal storm water quality control programs to the stakeholders, including public development.

## 11.2 Water Quality Monitoring Program

### 11.2.1 San Diego Region

The monitoring program developed for the San Diego region includes wet weather and dry weather monitoring components.

#### 11.2.1.1 San Diego Wet Weather Monitoring Program

Details on development and implementation of the wet weather monitoring program are included in Exhibit 11-I. The wet weather monitoring program includes the following components:

- Urban stream bioassessment - Using a “triad” of indicators (bioassessment, chemistry, toxicity), describe impacts on stream communities and the relationship of any impacts to runoff, based on comparisons with reference locations on a year-to-year time frame
- Long-term mass loading - Using measurements of key pollutants, measure loads over a time frame of years to decades to compare with past and present levels
- Coastal storm drains - Using a suite of bacterial indicators at high priority drain outfalls, track compliance with regulatory standards and any improvements due to BMP implementation
- Coastal receiving waters - Using measurement of runoff plume characteristics and extent, as well as measures of a suite of physical, chemical, and biological indicators, improve understanding of the impacts of runoff plumes on near shore ecosystems

#### 11.2.1.2 San Diego Dry Weather Monitoring Program

Details on development and implementation of the dry weather monitoring program are included in Exhibit 11-II. The dry weather monitoring program includes the following three main components:

- A set of randomly located stations intended to characterize the average area-wide conditions in urban runoff
- A set of rotating targeted stations intended to provide additional information about specific sites thought to have a high potential for contaminated runoff and to provide coverage of the entire MS4 system over the period of the permit term
- A set of criteria that will trigger focused IC/ID (illegal connection and illicit discharge) studies by the Permittees when the monitoring data indicate the presence of a problem.

#### 11.2.1.3 San Diego Monitoring Program Components

Specific monitoring tasks, sampling sites, and frequencies for the entire San Diego region are detailed in **Table 11-1**. A template for individual jurisdictions to use in describing their contribution to monitoring efforts is provided in Appendix A-11.

# SECTION 11, WATER QUALITY MONITORING

**Table 11-1. San Diego Region Water Quality Monitoring Program Components**

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H <sub>2</sub> O	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
Aliso Viejo					J01P28	J01P26
					J01P27	J01P33 J02P05
Dana Point	Salt Creek (K01) @ Monarch Beach Golf Links		Salt Creek (K01)	Doheney St. Beach (DSB 1) south end	Beach Rd. west of Palisades Rd.	K01P02
			North Beach Creek	Doheney St. Beach (DSB 4) restroom Bldg. 6	Doheney Park Rd. south of Camino Capistrano	K01P04
			San Juan Creek (L01)	Doheney St. Beach (DSB 5) creek at north end	Sepulveda Ave. south or Domingo Ave.	M00P01
			Doheney St. Beach 100 yards south of overpass	Dana Pt. Harbor (DPH 1) at Golden Lantern		L01S04
			Doheney St. Beach @ restroom Bldg. 6	Dana Pt. Harbor (DPH 2) between Adventure & Marina		
				Dana Pt. Harbor (DPH 3) N/W of DPH 2		
				Dana Cove (DC 1) left of pier		
				Niguel MLR (NI 1) near Selva & PCH		

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Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H <sub>2</sub> O	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
Laguna Beach	Aliso Creek(J01) @ Country Club Rd	Laguna Canyon (I02) @ Woodland	El Morro Creek	Aliso Creek (ACM 1) Creek mouth	N. Main Beach Stormdrain #13	J00P02
			Emerald Bay Drain	Aliso Beach (AB 01) 300 yards north of creek		I00P02
			Laguna Avenue	Laguna Beach Marine Life Refuge (LB 1) Diver's Cove		
			Heisler Park - North (Diver's Cove)	Laguna Beach MLR (LB 2) north part of Main Beach		
			Main Beach Boardwalk (I02)	Laguna Beach MLR (LB 3) end of Broadway		
			Cleo Street Storm Drain (I00P02)	Laguna Beach MLR (LB 4) south end of Main Beach		
			Bluebird Canyon Road			
			Ocean Way (Agate/Pearl)			
			Dumond Drive			
			Lagunita/Blue Lagoon 300 yards north of J01			
			West Street			

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					Targeted Sites	Random Sites
			Aliso Creek (J01)			
Laguna Hills					J04P04	
Laguna Niguel				Salt Creek (SCM 1) at creek mouth	J03TBN –Golden Lantern & Moulton L03P06 J04 @ J03 K01S02 K01P08 K01S01	J03P01 K01P08 K01P09 K01P07 L03P04 K01P04
Laguna Woods					Moulton at Calle Cortez J01 at Aliso Blvd.	
Lake Forest					J01P08	J01P02 J01P05
Mission Viejo	Trabuco Creek (L02) @ Avery Parkway				J01P03	J07P02 L02P20 L03P04



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Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H <sub>2</sub> O	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
						L03P11
<b>San Clemente</b>	Prima Descheca (M01) @ Calla Grande Vista	Prima Descheca (M01) @ Calla Grande Vista	Capistrano Co. Beach Drain (Concession)		Lapata & Calle del Cerro	M03P01
	Segunda Descheca (M02) u/s of Avenida Presido	Segunda Descheca (M02) @ El Camino Real	M00S01 at 35067 Beach Road  Poche Beach (M01)  Pico Drain (M02)  Mariposa  Linda Lane  Under Pier  Trafalgar Canyon  La Ladera  Riviera  Capo Shores at House 52  Capo Shores at House entrance		Bonita Stormdrain at M02	M00P03  M00P05
<b>San Juan Capistrano</b>	San Juan Creek (L01) @ La Novia	San Juan Creek (L01) @ La Novia			L05 & L01	L01P03
	Trabuco Creek (L02)	Trabuco Creek (L02)			L01 & S02	L02P02

# SECTION 11, WATER QUALITY MONITORING

**Table 11-1. San Diego Region Water Quality Monitoring Program Components**

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H <sub>2</sub> O	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
<b>San Juan Capistrano</b> (continued)	at Del Obispo Rd.	at Del Obispo Rd.			L01S03 (Doheney Park Rd. & Camino Capistrano)  West end of Avenida Veropuerto  L01 & Camino Capistrano	
<b>Rancho Santa Margarita</b>						L02P28  L02P32
<b>County of Orange</b>	Aliso Creek (J01) at Pacific Park Dr.  Aliso Creek (J01) @ Aliso/Woods Canyon Park  Wood Canyon (J02) on Wood Canyon Trail	Aliso Creek (J01) @ Aliso/Woods Canyon Park			L11P01	L02P20  L02P25

**Table 11-1. San Diego Region Water Quality Monitoring Program Components**

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H <sub>2</sub> O	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
	Laguna Canyon Creek along Highway 133					L02P29
County of Orange	San Juan Creek (L01) @ Cold Spring (Reference Site)					
	Silverado Cyn. d/s of Belha Way (Reference Site)					L02P45
	Sandia Creek on De Luz Road (Reference Site)					L02P50
						L02P55
						L11P02
						M02XXX @ Talega Valley

**Note:** Shaded areas indicates sites at which flows are diverted during the dry season

### 11.2.2 Santa Ana Region

The monitoring program developed for the San Diego region includes wet weather and dry weather monitoring components.

#### 11.2.2.1 Santa Ana Water Quality Monitoring Program

Details on development and implementation of the Santa Ana region Water Quality Monitoring Program are included in **Exhibit 11-III. The Third Term Permit monitoring program includes the following components:**

- Mass Emissions Monitoring – Estimates the total mass emissions from MS4, assesses mass emission trends over time and determines if the MS4 is contributing to exceedances of water quality objectives or beneficial uses.
- Estuary/Wetlands Monitoring – Monitors the Upper Newport estuary, Talbert Marsh and the Bolsa Chica wetlands area to determine the effects of stormwater and non-stormwater runoff.
- Water Column Toxicity Monitoring – Analyzes mass emission samples for freshwater and marine species toxicity to determine the impacts of stormwater and non-stormwater runoff on toxicity of receiving waters.
- Bacteriological/Pathogen – Determines the impacts of stormwater and non-stormwater runoff on loss of beneficial uses to receiving waters via monitoring of the coastline and six selected inland locations for total coliform, fecal coliform and Enterococcus.
- Bioassessment – In cooperation with the Southern California Coastal Water Research Project, will evaluate the biological index approach for Southern California.
- Reconnaissance – Identifies and prohibits illicit discharges.
- Land Use Correlations – Develops and implements strategies for determining the effects of land use on the quality of receiving waters. At a minimum, focuses on the conversion from agricultural land to developed in Orange County and its correlation to the sediment loading in Upper Newport Bay.
- TMDL/303(d) Listed Waterbody Monitoring – Continues Permittee participation in the Regional Monitoring Program for the San Diego Creek Nutrient TMDL. In addition, evaluates the impacts of stormwater and non-stormwater runoff on all impairments within the Newport Bay watershed and other 303(d) listed waterbodies.

#### 11.2.2.2 Santa Ana Monitoring Program Components

Specific monitoring tasks, sampling sites, and frequencies for the entire Santa Ana Regional Board area are included in Exhibit 11-III. Individual jurisdictions have described their contribution to monitoring efforts in **Appendix A-11.**

### 11.3 Water Quality Planning Initiatives

The Permittees have initiated several water quality planning efforts intended to identify and better understand site-specific urban water quality problems in Newport Bay / San Diego Creek Watershed (nutrients), Aliso Creek (bacteria) and Talbert/Lower Santa Ana River (bacteria). These water quality planning initiatives have been integrated with the development of watershed chapter (**Section 12.0**).

#### 11.3.1 Newport Bay Watershed

Newport Bay and certain sections of San Diego Creek have been listed as impaired for the presence of excess levels of fecal coliform, sediment and nutrients as well as toxicity to organisms.

The development of Total Maximum Daily Loads (TMDLs) allocations pursuant to Section 303(d) of the Clean Water Act has imposed additional requirements on the Newport Watershed Permittees (The County, Orange County Flood Control District and the cities of Costa Mesa, Irvine, Lake Forest, Laguna Hills, Laguna Woods, Newport Beach, Orange, Santa Ana, and Tustin) which include significant additional requirements on these Permittees for monitoring and program development.

#### 11.3.2 Santa Ana River Watershed

Elevated bacteria indicator levels in the surf zone off Huntington State Beach in 1999 were attributed, in part, to the storm drain system of the Talbert/Lower Santa Ana River Watershed. In response to a Section 13267 letter from the Regional Board, the Talbert/Lower Santa Ana River Watershed Permittees (The County, Orange County Flood Control District, and the cities of Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach and Santa Ana) committed to conducting monitoring investigations and research studies in conjunction with the University of California at Irvine and the National Water Research Institute.

These studies were initiated by these Permittees and subsequently expanded to include watershed-scale monitoring and investigations, including extensive dispersion monitoring in the surf zone. These studies were completed in a final report entitled *Huntington Beach Water Quality Investigation Phase II: An Analysis of Ocean, Surf zone, Watershed, Sediment and Groundwater Data Collected from June 1998 through September 2000 - December 15, 2000*. A follow-up study was initiated based on the results of the initial investigation.

As part of an early action plan, all storm drain and pump station discharges in this watershed were temporarily diverted during the summer months to the sanitary district. A number of these diversions are now becoming more permanent and are scheduled to extend through all dry season conditions. A considerable portion of the watershed is now being diverted, and the focus for continuing investigations is now on the remaining un-diverted drains previously identified as a potential significant source. Additional investigations will also be completed in the Talbert Marsh for critical ecological resources as part of the monitoring program.

### 11.3.3 Aliso Creek Watershed

The lower mile of Aliso Creek has been listed as impaired for the presence of elevated levels of fecal coliform. Pursuant to a 205(j) grant the County initiated a water quality planning study to complement ongoing watershed restoration efforts being conducted by the Corps of Engineers in conjunction with Aliso Creek watershed cities and special districts.

One of the results of the 205(j) study was the identification of elevated fecal coliform levels at many points along Aliso Creek and in its tributaries. One storm drain (identified as J03P02) exhibited higher fecal coliform levels than the rest and was issued a Clean Up and Abatement Order by the San Diego Regional Board pursuant to violations of the NPDES Stormwater Permit. The Order, as one action, assigns additional monitoring requirements to the J03P02 Permittees (The County, Orange County Flood Control District, and City of Laguna Niguel).

The Corps of Engineers Feasibility studies and the 205(j) water quality planning study provided the first comprehensive restoration plan for an entire watershed in Orange County. The 205(j) report was made available in late 2001.

As an early action, the flows from J03P02 were initially diverted during the summer months to the sanitary sewer. At the present time, these flows are being treated by a Clear Creek™ System, and the treated, bacteria-free water is being discharged into Sulphur Creek. However, this is considered a temporary measure until a treatment wetland currently under construction becomes operational.

Permittees have reported on additional technical information requests and special studies they have been involved with such as the collection of data/information for 13267 letters or clean up and abatement orders. The Permittees produced six quarterly reports examining characteristics of bacterial contamination and describing the results of source investigations following up on earlier work in the 205(j) study.